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09/669,280	09/26/2000	Chae Hun Chung	13424.5US01	5676

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EXAMINER	
KUMAR, PANKAJ	

ART UNIT	PAPER NUMBER
2631	6

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/669,280	CHUNG, CHAE HUN	
	Examiner	Art Unit	
	Pankaj Kumar	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 September 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 8* is/are rejected.

7)☒ Claim(s) *5-7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: Acronyms, such as FA, need to be spelled out at least at the first instance of their use. Appropriate correction is required.

2. The abstract of the disclosure is objected to because it is not in a single paragraph. Correction is required. See MPEP § 608.01(b).

Claim Objections

3. Claims 1-8 are objected to because of the following informalities:

4. Acronyms, such as FA, need to be spelled out at least at the first instance of their use.

5. Also claim 1 (and similarly claim 8) says "... down-convert to baseband signals and generating the ... baseband signals to the channel cards ..." Since signals have already been down converted to baseband, the baseband signals have inherently been generated and accordingly there should no longer be the need to again recite generating the baseband signals.

6. Also, the meaning of the following, from this same section of claim 1 (and similarly from claim 8), is not clear: "generating the ... baseband signals to the channel cards"

7. Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling 5,422,908.

10. As per claim 1, Schilling teaches a radio frequency (RF) receiver for a code division multiple access (CDMA) mobile communication base station system, which has a plurality of receive blocks for receiving RF signals via a plurality of antennas, and a plurality of FA-based channel cards (Schilling fig. 3: one card of 11, 21, 23, etc. and another card of 12, 22, 23, etc.), the RF receiver comprising (preamble does not hold patentable weight): an analog down-converting means for down-converting multi-FA RF signals on the respective reception paths output from the plural receive blocks to intermediate frequency (IF) signals (Schilling fig. 3: 21, 22); and a digital down-converting means for converting the IF signals of 3 FA's on the respective reception paths output from the analog down-converting means to digital signals by reception paths (Schilling fig. 3: 23, 24), dividing the digital signals into in-phase (I) and quadrature (Q) channels of the FA's on the respective reception paths to down-convert the digital signals to I/Q channel baseband signals (not in Schilling but would be obvious as explained below), and generating the FA-based I/Q channel baseband signals to the channel cards corresponding to the respective FA's (see claim objections; also, the I/Q baseband signals correspond to the channel cards).

11. Schilling does not teach dividing the digital signals into in-phase (I) and quadrature (Q) channels of the FA's on the respective reception paths to down-convert the digital signals to I/Q

channel baseband signals. Schilling teaches I/Q before the A/D instead of the claimed after the A/D.

12. It is common knowledge to reverse parts of an invention.

13. It would have been obvious to one skilled in the art at the time of the invention to modify Schilling to teach I/Q after the A/D.

14. One would be motivated to do so since one achieves greater accuracy by dividing digital signals into I and Q components rather than analog signals.

15. Claims 1-4, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee 6,169,733.

16. As per claim 1, Lee teaches a radio frequency (RF) receiver for a code division multiple access (CDMA) mobile communication base station system, which has a plurality of receive blocks for receiving RF signals via a plurality of antennas, and a plurality of FA-based channel cards (Lee fig. 1: one channel card is 52 and obvious to duplicate as explained below), the RF receiver comprising (preamble does not hold patentable weight): an analog down-converting means (Lee fig. 2: 60, mixer 59) for down-converting multi-FA RF signals on the respective reception paths (Lee shows one reception path (i.e. arrows pointed to the right in figures 1 and 2) and not multiple reception paths but it would be obvious as explained below) output from the plural receive blocks to intermediate frequency (IF) signals (Lee fig. 2: after filter 59, signal goes to IF); and a digital down-converting means for converting the IF signals (Lee fig. 2: 79 inphase RX and quadrature Rx also in figure 1 which go to 24 A/D) of 3 FA's on the respective reception

paths (again Lee shows one path and not multiple paths but it would be obvious as explained below) output from the analog down-converting means to digital signals by reception paths (Lee fig. 1: output of 24), dividing the digital signals into in-phase (I) and quadrature (Q) channels of the FA's on the respective reception paths to down-convert the digital signals to I/Q channel baseband signals (not in Lee but would be obvious as explained below), and generating the FA-based I/Q channel baseband signals to the channel cards corresponding to the respective FA's (see claim objections; also, the I/Q baseband signals correspond to the channel cards).

17. Lee teaches one channel card 52. Lee does not teach a plurality of channel cards for signal reception.

18. It is common knowledge to duplicate elements.

19. It would have been obvious to one skilled in the art at the time of the invention to modify Lee to teach a plurality of channel cards.

20. One would have been motivated to do so since duplicating elements helps a system to have better fault tolerant capability.

21. Lee teaches one reception path (i.e. arrows pointed to the right in figures 1 and 2).

22. Lee does not teach multiple reception paths.

23. It is common knowledge to duplicate elements.

24. It would have been obvious to one skilled in the art at the time of the invention to modify Lee to teach multiple reception paths.

25. One would have been motivated to do so since duplicating elements helps a system to have better fault tolerant capability.

26. Lee does not teach dividing the digital signals into in-phase (I) and quadrature (Q) channels of the FA's on the respective reception paths to down-convert the digital signals to I/Q channel baseband signals.

27. Lee teaches I/Q before the A/D instead of the claimed after the A/D.

28. It is common knowledge to reverse parts of an invention.

29. It would have been obvious to one skilled in the art at the time of the invention to modify Lee to teach I/Q after the A/D.

30. One would be motivated to do so since one achieves greater accuracy by dividing digital signals into I and Q components rather than analog signals.

31. As per claim 2, Lee teaches the RF receiver as claimed in claim 1, wherein the analog down converting means comprises: a local oscillator (Lee fig. 2: 60) on the individual reception paths for generating a local frequency; a mixer (Lee fig. 2: mixer 59) on the individual reception paths for mixing the local frequency generated from the local oscillator with the multi-FA RF signals on the individual reception paths output from the plural receive blocks to generate multi-FA IF signals on the individual reception paths; and an SAW filter (Lee fig. 2: 63 "SAW filter") on the individual reception paths for limiting the band of the multi-FA IF signals on the individual reception paths output from the individual mixer to the bandpass of a bandwidth corresponding to the multi-FA bandwidth.

32. As per claim 3, Lee teaches the RF receiver as claimed in claim 2, wherein the multiple FA's are 3 FA's, the IF frequency on the individual reception paths of "0" and "1" is 70 MHz, and

the bandwidth of the SAW filter is 3.75 MHz corresponding to the 3 FA's. (Lee: obvious to choose numbers as explained below)

33. Lee does not teach these specific numbers.

34. It is common knowledge in the art to experiment to find values for result effective variables.

35. It would have been obvious to one skilled in the art at the time of the invention to modify Lee to teach these specific numbers.

36. One would be motivated to do so since it has been held that choosing values for result effective variables requires routine skill in the art.

37. As per claim 4, Lee teaches the RF receiver as claimed in claim 1, wherein the digital down converting means comprises: an analog-to-digital converter (Lee fig. 1: 24) on the individual reception paths for converting the IF signals output from the analog down-converters to digital signals; a FA-based digital unit on the individual reception paths for dividing the digital signals output from each analog-to-digital converter into the FA-based I/Q channels (not in Lee but would be obvious since Lee has I/Q before A/D as explained for claim 1) on the individual reception paths to perform QPSK demodulation and down-converting the I/Q channel digital signals to I/Q channel baseband signals (Lee has demodulation but not QPSK demodulation but QPSK would be obvious since Lee's fig. 4 has decoding as per IS-95 (CDMA) or decoding as per IS-136 (TDMA) or decoding as per EIA-553 (AMPS) which would involve QPSK demodulation and downconversion if the signal was a QPSK signal as explained below); and a multiplexer for multiplexing the reception paths and the I/Q channel baseband signals output

from the FA-based digital unit and generating the multiplexed digital signals to the channel cards corresponding to the respective FA's (see claim objections; also, the I/Q baseband signals correspond to the channel cards).

38. Lee does not teach QPSK demodulation. Lee teaches demodulation since in figure 2, signal is being demodulated from a high frequency such as 100MHz center frequency in 63 down to baseband or 0 MHz center frequency output of 79.

39. It is common knowledge in the art that a modulation scheme is a result effective variable and it is common knowledge in the art to choose between different demodulation schemes such as QPSK, m-ary PSK, AM, FM, etc. especially if a signal has been modulated using a modulation scheme such as QPSK, m-ary PSK, AM, FM, etc.

40. It would have been obvious to one skilled in the art at the time of the invention to modify the demodulation in Lee to teach QPSK demodulation.

41. One would be motivated to do so since demodulation scheme is a result effective variable and choosing a demodulation scheme or result effective variable would require routine skill in the art.

42. As per claim 8, Lee teaches an RF receiver for a CDMA mobile communication base station system, which has two receive blocks for receiving RF signals via two antennas, and FA-based channel cards (Lee fig. 1: one channel card is 52 and obvious to duplicate as explained below), the RF receiver comprising (preamble does not hold patentable weight): an analog down-converter for down-converting multi-FA RF signals on first and second reception paths (Lee teaches one reception path in fig. 1: 52 and not two receptions paths but it would be obvious to

have multiple reception paths as explained below) output from the two receive blocks to IF signals (Lee fig. 2: after filter 59, signal goes to IF); two analog-to-digital converters for converting the down-converted IF signals on the first and second reception paths from the analog down-converter to digital signals (Lee fig. 1: 24 says it has "A/D converters" and its inputs are I and Q); FA-based digital units on the first and second reception paths for dividing the digital signals output from the two analog-to-digital converters into FA-based I and Q channels on the first and second reception paths to perform QPSK demodulation, and down-converting the I/Q channel digital signals to baseband signals (Lee fig. 2: output of 79 are demodulated I/Q; Lee has demodulation but not QPSK demodulation but QPSK would be obvious since Lee's fig. 4 has decoding as per IS-95 (CDMA) or decoding as per IS-136 (TDMA) or decoding as per EIA-553 (AMPS) which would involve QPSK demodulation and downconversion if the signal was a QPSK signal as explained below); and a multiplexer for multiplexing the first and second reception paths and the I/Q channel baseband signals on the first and second reception paths output from the FA based digital units and generating the multiplexed digital signals to the channel cards corresponding to the respective FA's (see claim objections; also, the I/Q baseband signals correspond to the channel cards).

43. Lee teaches one channel card 52. Lee does not teach a plurality of channel cards for signal reception.

44. It is common knowledge to duplicate elements.

45. It would have been obvious to one skilled in the art at the time of the invention to modify Lee to teach a plurality of channel cards.

46. One would have been motivated to do so since duplicating elements helps a system to have better fault tolerant capability.

47. Lee teaches one reception path (i.e. arrows pointed to the right in figures 1 and 2).

48. Lee does not teach multiple reception paths.

49. It is common knowledge to duplicate elements.

50. It would have been obvious to one skilled in the art at the time of the invention to modify Lee to teach multiple reception paths.

51. One would have been motivated to do so since duplicating elements helps a system to have better fault tolerant capability.

52. Lee does not teach QPSK demodulation. Lee teaches demodulation since in figure 2, signal is being demodulated from a high frequency such as 100MHz center frequency in 63 down to baseband or 0 MHz center frequency output of 79.

53. It is common knowledge in the art that a modulation scheme is a result effective variable and it is common knowledge in the art to choose between different demodulation schemes such as QPSK, m-ary PSK, AM, FM, etc. especially if a signal has been modulated using a modulation scheme such as QPSK, m-ary PSK, AM, FM, etc.

54. It would have been obvious to one skilled in the art at the time of the invention to modify the demodulation in Lee to teach QPSK demodulation.

55. One would be motivated to do so since demodulation scheme is a result effective variable and choosing a demodulation scheme or result effective variable would require routine skill in the art.

Allowable Subject Matter

56. Claims 5-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and also overcoming claim objections to the base and intervening claims.

Conclusion

57. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (703) 305-0194. The examiner can normally be reached on Mon, Tues, Wed and Thurs after 8AM to after 6:30PM.

58. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (703) 306-3034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

59. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PK

MOHAMMAD H. GHAYOUR
PRIMARY EXAMINER